CLAIMS

1. A method for producing a male sterile plant characterized in that said method comprises the step of decreasing the level of 11-and/or 12-hydroxyjasmonate by increasing in said plant the level of *in-vivo* sulfonation of hydroxyjasmonates or decreasing the level of synthesis of 11-and/or 12-hydroxyjasmonate.

2. The method of claim 1, characterized in that the level of *in-vivo* sulfonation of hydroxyjasmonates is increased by increasing in said plant the endogenous activity of a hydroxyjasmonate sulfotransferase.

3. The method of claim 1, characterized in that the level of synthesis of 11-and/or 12- hydroxyjasmonate is decreased by decreasing in said plant the activity of a jasmonic acid 11-/ 12- hydroxylase.

4. The method according to any one of claims 1 to 3, characterized in that the increasing of the level of *in-vivo* sulfonation of hydroxyjasmonates or the decreasing of the level of synthesis of 11-and/or 12- hydroxyjasmonate is achieved by a process selected from the group consisting of genetic modification of said plant, radiation mutagenesis of said plant, chemical mutagenesis of said plant and selection of natural mutants.

5. The method of claim 4, characterized in that said method consists of genetic modification.

6. The method of claim 5, characterized in that the endogenous activity of the sulfotransferase is increased by stimulating the expression of at least one gene selected from the group consisting of: *AtST2a, AtST2b*, functional homologues thereof having at least 50% homology with SEQ ID no. 1 or SEQ ID no. 2 and a nucleic acid encoding for an amino acid sequence

having at least 50% homology with amino acid sequence of SEQ ID no. 3 or SEQ ID no. 4.

7. A plant cell transformation vector capable of facilitating transfer and expression of an exogenous nucleic acid into an isolated cell and/or facilitating integration of an exogenous nucleic acid into genome of said cell, characterized in that said vector comprises at least one promoter sequence, one enhancer sequence and one exogenous nucleic acid sequence, said promoter being a constitutive expression promoter or an inducible promoter, said exogenous nucleic acid being selected from the group consisting of nucleic acid sequence having at least 50% homology with SEQ ID no. 1 or SEQ ID no. 2 and a nucleic acid encoding for an amino acid sequence having at least 50% homology with amino acid sequence of SEQ ID no. 3 or SEQ ID no. 4.

8. The vector of claim 7, characterized in that the inducible promoter is an ethanol-inducible promoter or a glucocorticoid-inducible promoter.

9. The vector of claim 7, characterized in that the constitutive expression promoter is an ubiquitin promoter.

10. The vector of claim 7, characterized in that the promoter is CaMV 35S promoter.

11. The vector of claim 7, characterized in that the enhancer is an AMV translational enhancer.

12. A method for producing a male sterile plant, characterized in that said method comprises:
    - introducing into a cell of a suitable plant an exogenous nucleic acid molecule via the vector as defined in any one of claims 7 to 11;
    - regenerating a transgenic plant from said cell; and where necessary

- growing the transgenic plant for a time and under conditions sufficient to permit expression of the exogenous nucleic acid sequence and thereby stimulating expression of the hydroxyjasmonic acid sulfotransferase.

13. A genetically modified male sterile plant, characterized in that the endogenous level of 11- or 12- hydroxyjasmonate in said genetically modified male sterile plant is lower than the endogenous level of 11- or 12-hydroxyjasmonate in a non genetically modified plant.

14. A genetically modified male sterile plant, characterized in that the endogenous level of 11- or 12- hydroxyjasmonic acid sulfotransferase in said genetically modified male sterile plant is higher than the endogenous level of 11- or 12- hydroxyjasmonic acid sulfotransferase in a non genetically modified plant.

15. A composition for restoring normal anther development in a genetically modified male sterile plant, comprising at least one jasmonate and an acceptable carrier.

16. The composition of claim 15, characterized in that the jasmonate is selected from the group consisting of: 11- hydroxyjasmonic acid, 12-hydroxyjasmonic acid, glucoside of 11- hydroxyjasmonic acid, glucoside of 12- hydroxyjasmonic acid, 11- hydroxymethyljasmonic acid, glucoside of 11- hydroxymethyljasmonic acid, 12- hydroxymethyljasmonic acid and glucoside of 12- hydroxymethyljasmonic acid.

17. The composition of claim 15, characterized in that the composition contains 100µM of 12-hydroxyjasmonic acid or 50µM methyl- jasmonic acid.

18. The composition of claim 17, characterized in that the composition further contains TWEEN20™.

19. The composition of claim 18, characterized in that the composition contains TWEEN20™ in the concentration of 0.05 weight percent of the total volume of said composition.

20. A method for restoring normal anther development in a genetically modified male sterile plant as defined in any one of claims 13 or 14, comprising a step of applying on male sterile flowers of said plant a composition as defined in any one of claims 15 to 19.

21. The method of claim 20, characterized in that the step of applying said composition on male sterile flowers of said plant is achieved by soaking male sterile flowers in said composition for two minutes daily starting 7 days before appearance of a first flower bud and ending 7 days after appearance of a first flower.

22. A composition for restoring normal anther development in a genetically modified male sterile plant, comprising at least one 11-/12-OHJA sulfotransferase inhibitor and an acceptable carrier.

23. A method for restoring normal anther development in a genetically modified male sterile plant as defined in any one of claims 13 or 14, comprising a step of applying on male sterile flowers of said plant a composition as defined in claim 22.